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Preliminary Analysis of Virginia's Black Drum (Pogonias cromis) Recreational and Commerical Fisheries

Joseph C. Desfosse
Virginia Institute of Marine Science

PRELIMINARY ANALYSIS OF VIRGINIA'S BLACK DRUM (*Pogonias cromis*) RECREATIONAL AND COMMERCIAL FISHERIES

by

Joseph C. Desfosse

VIRGINIA INSTITUTE OF MARINE SCIENCE

SCHOOL OF MARINE SCIENCE

COLLEGE OF WILLIAM AND MARY

Gloucester Point, Virginia

prepared for the

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Abstract

One hundred ninety-one black drum, Pogonias cromis, were examined from the recreational fishery operating out of Cape Charles, Virginia, for size, age and sex. Fish ranged from 26.5-50.25 in FL (67.3-127.6 cm) and 6-74 lbs (2.7-33.6 kgs). Average fish size was 43.3 in (110 cm) and 43.05 lbs (19.5 kgs). Age was determined from scales and ranged from 4-15 years. Ten year-old fish dominate in the catch. Females outnumber males 110 to 50 (2.2:1). The majority of fish caught were spent individuals, 78 and 57.1% of the males and females respectively. Age-length and age-weight data gathered in this study are not comparable to earlier studies and may reflect density-dependent population factors. Limited data from the commercial fishery was made available and compared to the recreational data.

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Introduction

The black drum, Pogonias cromis (Linnaeus), is the largest member of the drum family (Sciaenidae) (Silverman 1979). It ranges from Nova Scotia south along the Atlantic coast and Gulf of Mexico to Argentina (Briggs 1958; Bleakney 1963). It is most abundant along the Texas coast (Simmons and Breuer 1962) and common along the Atlantic coast from Chesapeake Bay to Florida (Sutter et al. 1986). Maximum reported size is over four feet (1.2 m) and 146 pounds (66.3 kg) (Hildebrand and Schroeder 1928; Silverman 1979). The increased popularity of black drum as both a game and food fish, and lack of information regarding it in Virginia waters, prompted this survey of the size, age and sex composition of the recreational and commercial catch during May, 1986.

Materials and Methods

Size, age and sex composition data were gathered from recreational catches landed at King's Creek Marina, Cape Charles, Virginia, during 22-24 May 1986. This coincided with the peak of the recreational fishing season and afforded the opportunity to gather the most data in a relatively short period of time. A total of 191 fish were examined. Fork length (FL) was recorded to the nearest quarter inch (1/4 in) using a tape rule. Total weight was recorded to the nearest one pound. Sex and reproductive stage were determined by internal inspection. Scales were taken for age determination.

Data from Virginia's Eastern Shore commercial fisheries was gathered from summary reports forwarded to the Virginia Marine Resources Commission Eastern Shore Field Technician. Number of fish caught per day and total and fillet weights were reported. No lengths were available. Total landings figures for the state of Virginia were made available following the season and are incorporated here.

Results

Recreationally caught fish ranged in size from 26.5-50.25 in FL (67.3-127.6 cm) and 6-74 lbs (2.7-33.6 kg) (Table 1). Average fork length differed slightly between the sexes, 42.5 and 43.74 in FL (108 and 111 cm) for males and females, respectively. Females weighed an average of 6.5 lbs (2.9 kg) greater. Average fish size was 43.3 in FL (110 cm) (n=179) and 43.05 lbs (19.5 kg) (n=137). Figure 1 depicts size composition of the recreational catch sampled. The majority (96%) were over 38 in FL (96.5 cm).

Females outnumbered males 110 to 50 (2.2:1). Fish were assigned to one of six maturity stages are summarized in table 2. Most were spent, 78 and 57.1% of the males and females, respectively. Ripe fish and those that could not be assigned to a category, comprised the majority of remaining individuals.

Scales were examined under a dissecting scope and age determination followed the method of Richards' (1973). Some difficulty was encountered in discerning rings but following repeated observations, agreement between repetitions was achieved. Age ranged from 4 to 15 years. Figure 2 depicts the age composition by sex of recreationally caught black drum. Most fish were eight years or older, with ten year-olds the dominant year-class.

Age-length and age-weight data gathered in this survey were not comparable to the findings of Richards (1973). In figure 3, Richards' length-age curve is superimposed on data from this survey. Differences can be noted between the two studies. Although no statistical analysis was performed, the data points from this study clearly lie below the curves generated from Richards' data. Three explanations for this can be made: (1) density dependent population factors may have supressed growth during the 1970-1980's;

(2) data for this study was gathered with a highly selective gear, i.e. hook and line, while Richards' data came from a wide variety of sources, both recreational and commercial, and may have better represented the population at that time; (3) due to the difficulty in ascertaining age from black drum scales, age may have been slightly overestimated.

The other objective of this study was to document size, age and sex composition of commercially caught black drum in Virginia waters. During the season, summary reports were forwarded to Lewis Gillingham (VMRC Field Technician) and made available for this report by Jane DiCosimo (VMRC Fisheries Management Specialist). A total of 396 black drum were landed by Virginia's Eastern Shore commercial fishermen during 26 April-6 May 1986. Average weight of these fish was 34.14 lbs (15.5 kg).

Utilizing Richards' (1973) length-weight relationship for black drum from Virginia waters:

$$\log Y = 3.0655 \log X = -3.3250$$

where Y = weight in pounds and X = fork length in inches, the average length of commercially caught black drum was approximately 38.4 in (97.6 cm). This size is appreciably smaller than that recorded from the recreational fishery (43.3 in) (110 cm). This may be attributed to the nonselective nature of the commercial gear as opposed to the recreational angler's selective nature, i.e. wanting to bring back the largest fish possible.

Commercial landings of black drum in 1986 were three times greater than the previous high (1983) dating back to 1973 (figure 5). Table 3 gives a breakdown of landings by month of capture and fishing gear. The commercial fishery operated mainly during April to June with May the peak month. Staked

gill nets accounted for 88% of the catch and drift/anchor gill nets another 7%. The total value of the catch was $73,503 with an average price per pound of 35 cents. Most of the catch was reported as being from unclassified seaside bays and rivers (60.5%). Another 36.9% of the catch was reported from lower Chesapeake Bay (eastern and western portions) and the upper eastern portion of the bay (see figure 6 and table 4).

Discussion

The 1986 recreational and commercial fisheries turned out to be the best in recent history (figure 5). Some fishermen said it was the best in at least seven years (D. Stiles, pers. comm.). Presently, both fisheries depend on a few large year-classes spawned in the late 1970's (figure 2). There is no evidence from the recreational fishery that smaller (and younger) fish were present in Virginia during May, 1986 (figure 1). Due to the less selective nature of the commercial fishing gear, a more representative sample of the size and age composition of the population could be gathered. Unfortunately, first hand data of this nature is presently lacking from the commercial fishery.

A 16 in minimum size limit for black drum has been proposed by the Virginia Federation of Anglers. Additionally, two fish over a 32 in size (trophy size) would be allowed per angler. The average size of black drum caught in both fisheries in 1986 exceeded the minimum proposed size. Thought must be given to the size and age at which these fish reach maturity, and which are most responsible for maintaining the stock (fecundity estimates). The only data available on black drum maturity comes from the Gulf of Mexico where they mature at 11.2-13 in (28.5-33.0 cm) (Simmons and Breuer 1962; Silverman 1979). The only mention of fecundity is an estimate by Pearson (1929), that a 44 in (100 cm) female from Texas had approximately 5,976,000 eggs. Data necessary to make the decision on a size limit in Virginia is lacking. Sciaenids in the Gulf of Mexico often reach sexual maturity before east coast stocks so a size at maturity of 14-16 in would not be unlikely.

Consideration must also be directed at a catch limit. There is nothing during periods of abundance to prevent catching as many legal size fish as

possible. A genuine concern for the status of black drum exists among the recreational fishermen. During the fishing season, there was a self imposed limit of two (2) fish per person or twelve (12) fish per charter boat operating from King's Creek Marina. None of the charters I spoke with complained about the limit. If a limit is not imposed across the board, recreational anglers are unlikely to support any creel limit because it would not apply to commercial fishermen.

There are still many questions to be answered before informed management of this species and also red drum, Scianops ocellata, can occur. These are listed in order of importance as follows:

1. Additional data on the size, age and sex composition of both the recreational and commercial fisheries.

2. Data on the age and size at which black drum reach maturity in Virginia and concordant fecundity data.

3. Data on the effort expended in each of the fisheries.

4. Studies investigating the possibility of separate stocks existing along the Atlantic coast.

5. Investigation of the differential growth between the sexes noted in this study.

6. A study detailing the recreational fishery's impact on local economies.

These observations should be followed up in subsequent years, considering that this is a large industry in terms of the recreational fishery at least, and so little is known about black drum in Virginia.

Acknowledgements

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Table 1. Average weight and fork length of black drum sampled at Cape Charles, 22-24 May 1986 (range and sample size given below).

SEX	WEIGHT (lbs)	FORK LENGTH (in)
Males	37.95 (6-73) n=37	42.50 (26.5-48.0) n=50
Females	44.50 (20-74) n=89	43.74 (36.5-50.25) n=110
All	43.05 (6-74) n=137	43.30 (26.5-50.25) n=179

Table 2. Number of black drum by sex at assigned sexual maturity stage (percent of total in paratheses).

SEX	RIPE	PART. SPENT	SPENT	UNKNOWN
Males	9 (18.0)	1 (2.0)	39 (78.0)	1 (2.0)
Females	23 (20.5)	3 (2.8)	64 (57.1)	22 (19.6)
All	32 (19.7)	4 (2.5)	103 (63.6)	23 (14.2)

Table 3. Commercial landings of black drum, Pogonias cromis, by month and type of gear. Landings are in pounds (lbs) and values in dollars ($). (Source: Virginia Marine Resources Commission).

	FISHING GEAR						
Month	Trawl	Pound net	Staked gill net	Drift/anchor gill net	Hand line	Total	Value
Jan.	8					8	2
Feb.							
Mar.							
Apr.	105	75	33063	10516		43759	15555
May		468	142977	4097	5873	153415	55456
June		1933	7311		113	9357	2305
July							
Aug.		20				20	4
Sep.	90					90	27
Oct.	150			3		153	27
Nov.	31					31	3
Dec.	264					264	124
Total	648	2496	183351	14616	5986	207097	73503

Table 4. Commercial landings of black drum, *Pogonias cromis*, for 1986 by area of capture. Landings are in pounds (lbs) and values in dollars ($). (Source: Virginia Marine Resources Commission)

Area	Total Landings	Percent Total	Value
3	64	>.1	10
55	263	.1	48
97 - Where	125413	60.5	42392
195	75	>.1	15
211	22812	11.0	8311
311	2094	1.0	332
411	51628	24.9	20634
614	90	>.1	27
621	18	>.1	4
625	4290	2.1	1596
631	350	.2	134
All	207097		73503

Figure 1. Length frequency of black drum, Pogonias cromis, sampled from the Cape Charles, VA, recreational fishery, 22-24 May 1986.

BLACK DRUM LENGTH FREQUENCY

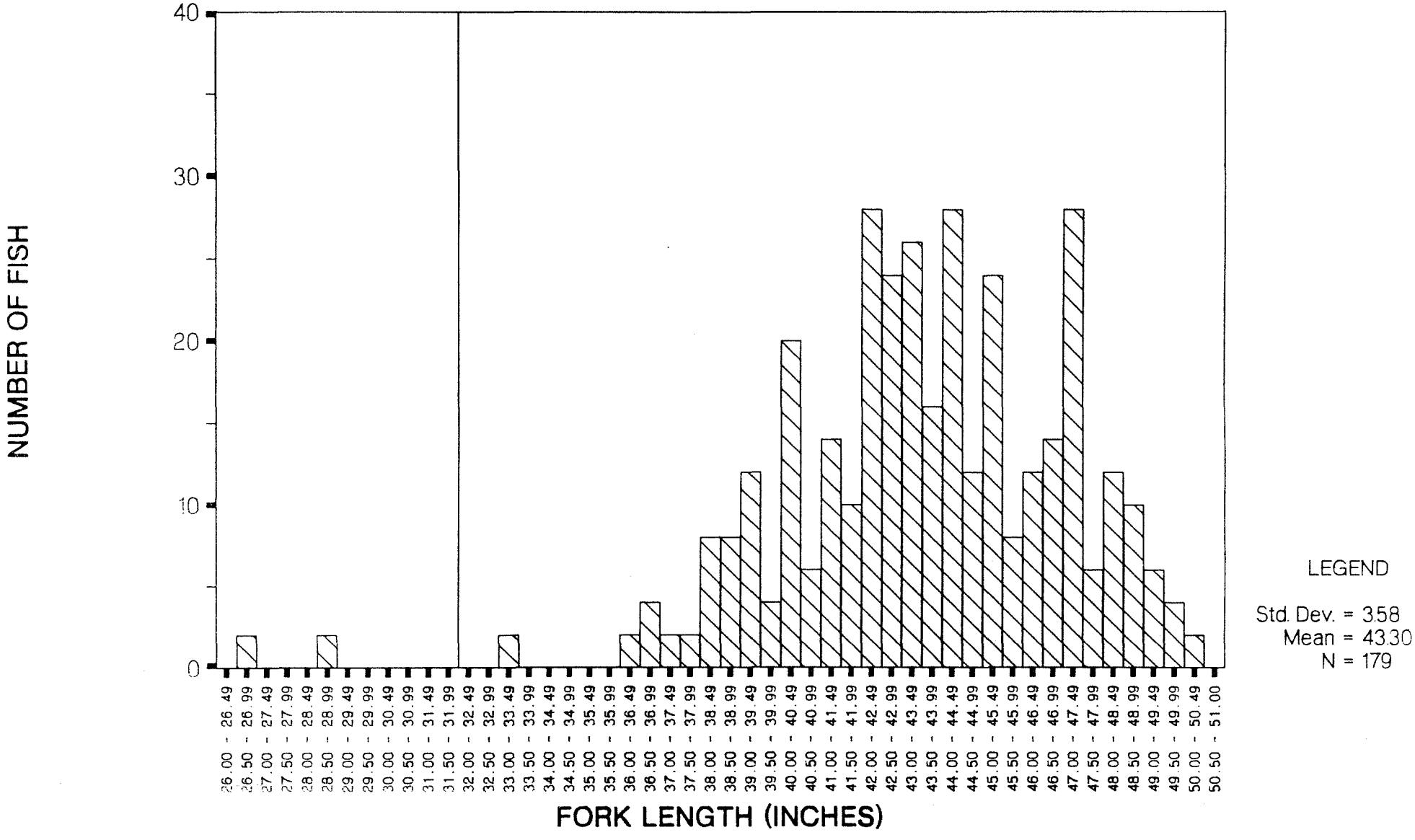


Figure 2. Age frequency of black drum, Pogonias cromis, sampled from the Cape Charles, VA, recreational fishery, 22-24 May 1986.

BLACK DRUM AGE FREQUENCY

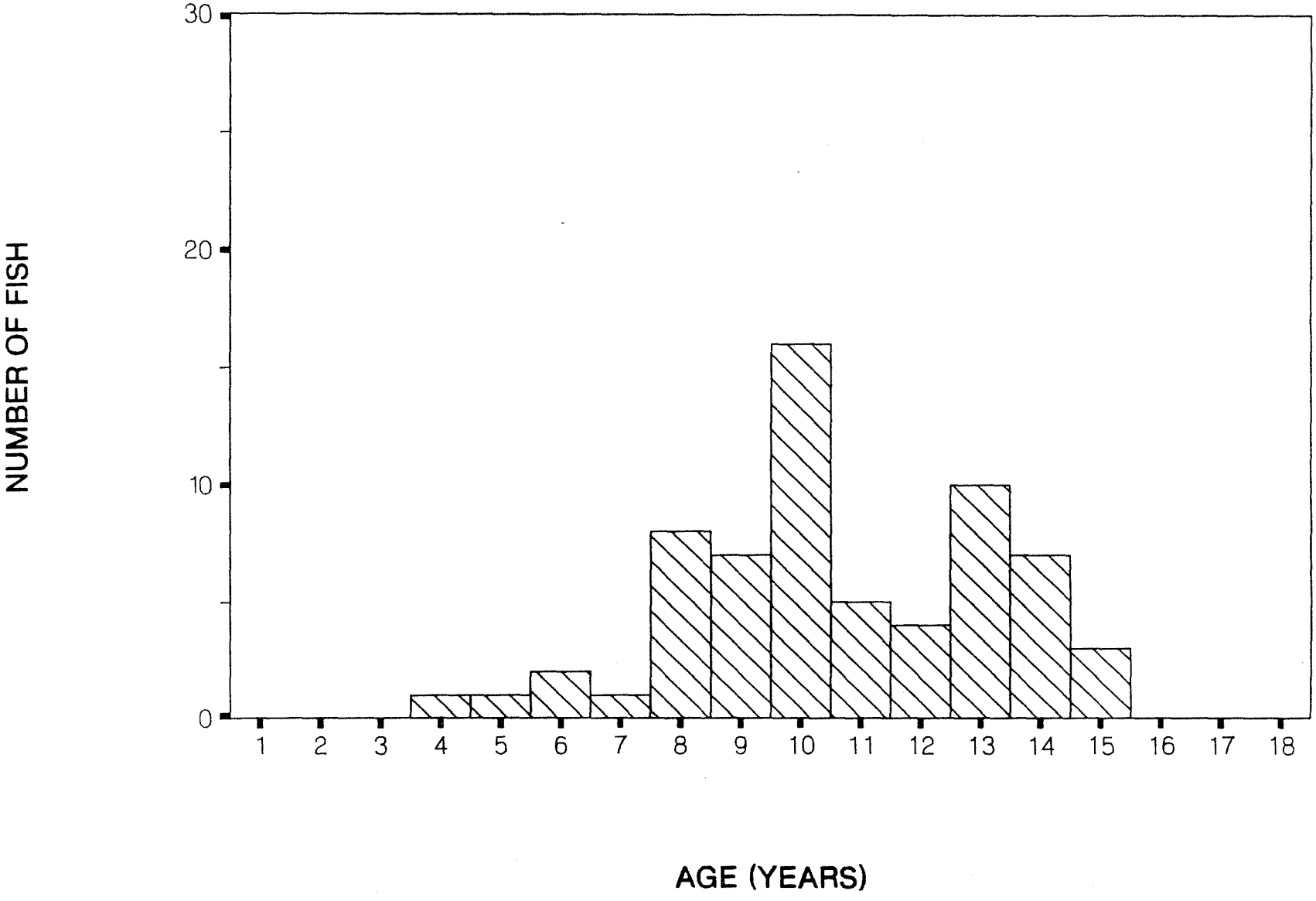


Figure 3. Age-length data (open squares) of black drum, Pogonias cromis, sampled from the Cape Charles, VA, recreational fishery, 22-24 May, 1986, with Richards' (1973) length-age curve superimposed.

BLACK DRUM AGE-LENGTH RELATIONSHIP

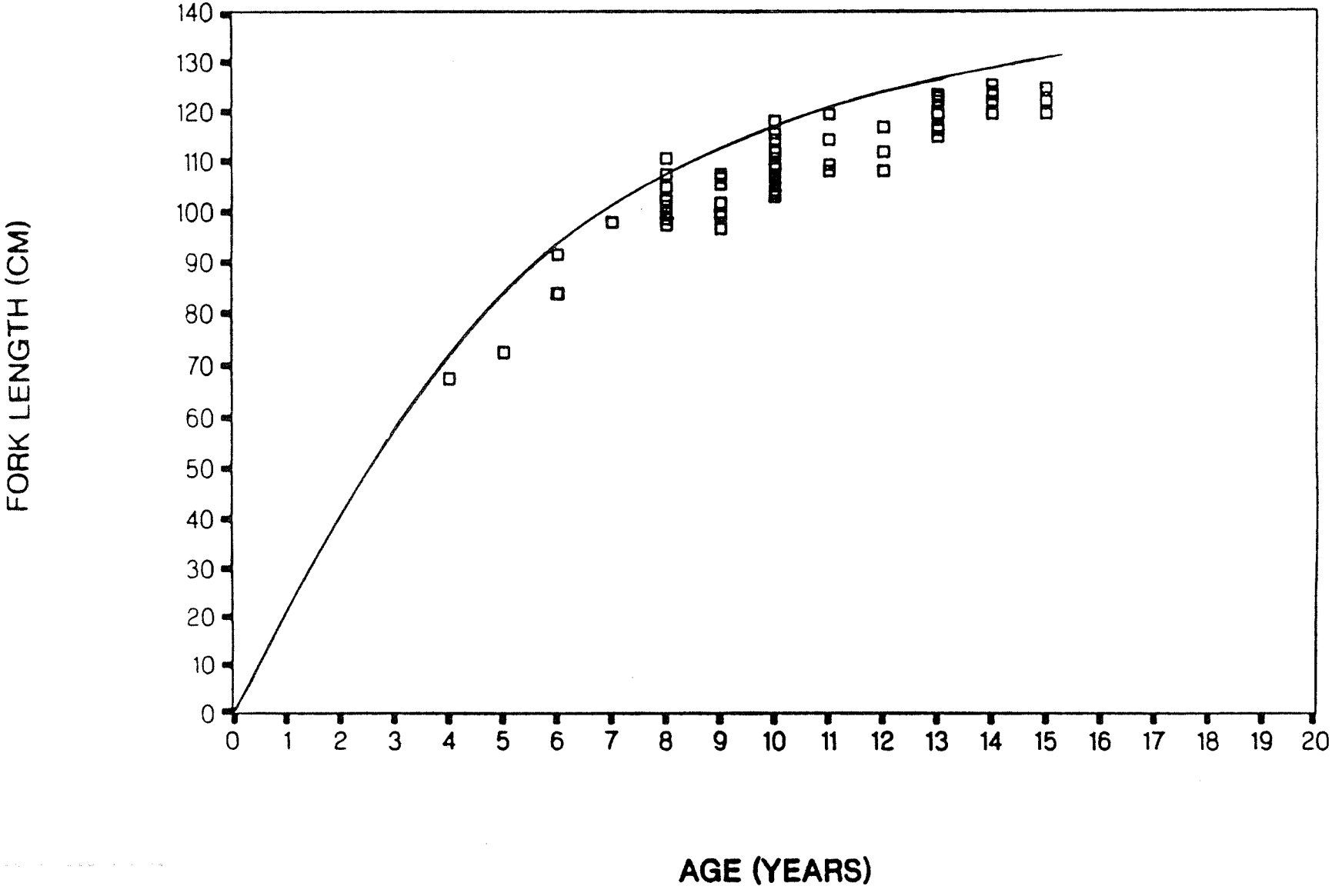


Figure 4. Age-length curve for black drum, Pogonias cromis, sampled from the Cape Charles, VA, recreational fishery, 22-24 May, 1986. Horizontal line depicts 32 inch size.

BLACK DRUM AGE-LENGTH RELATIONSHIP

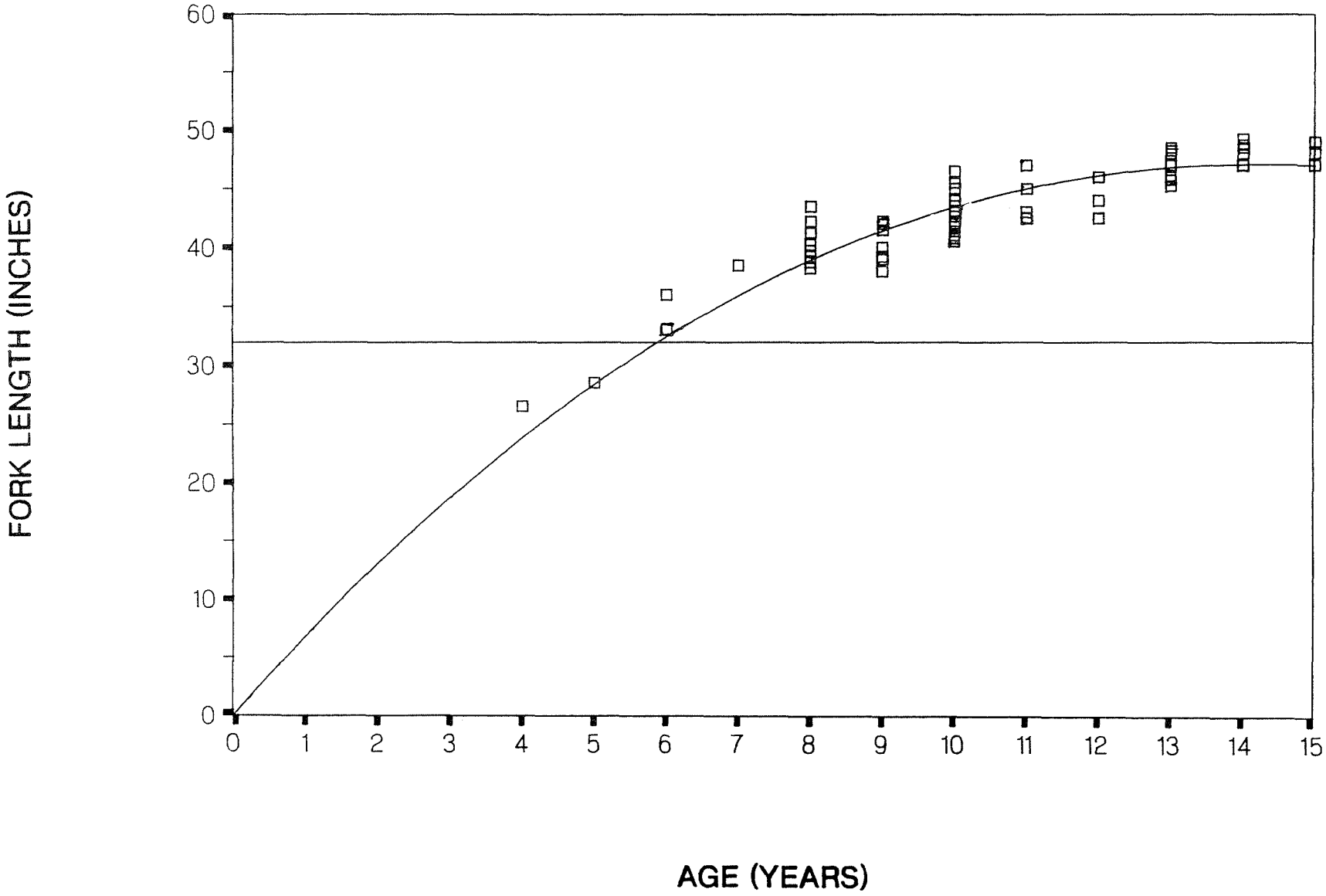
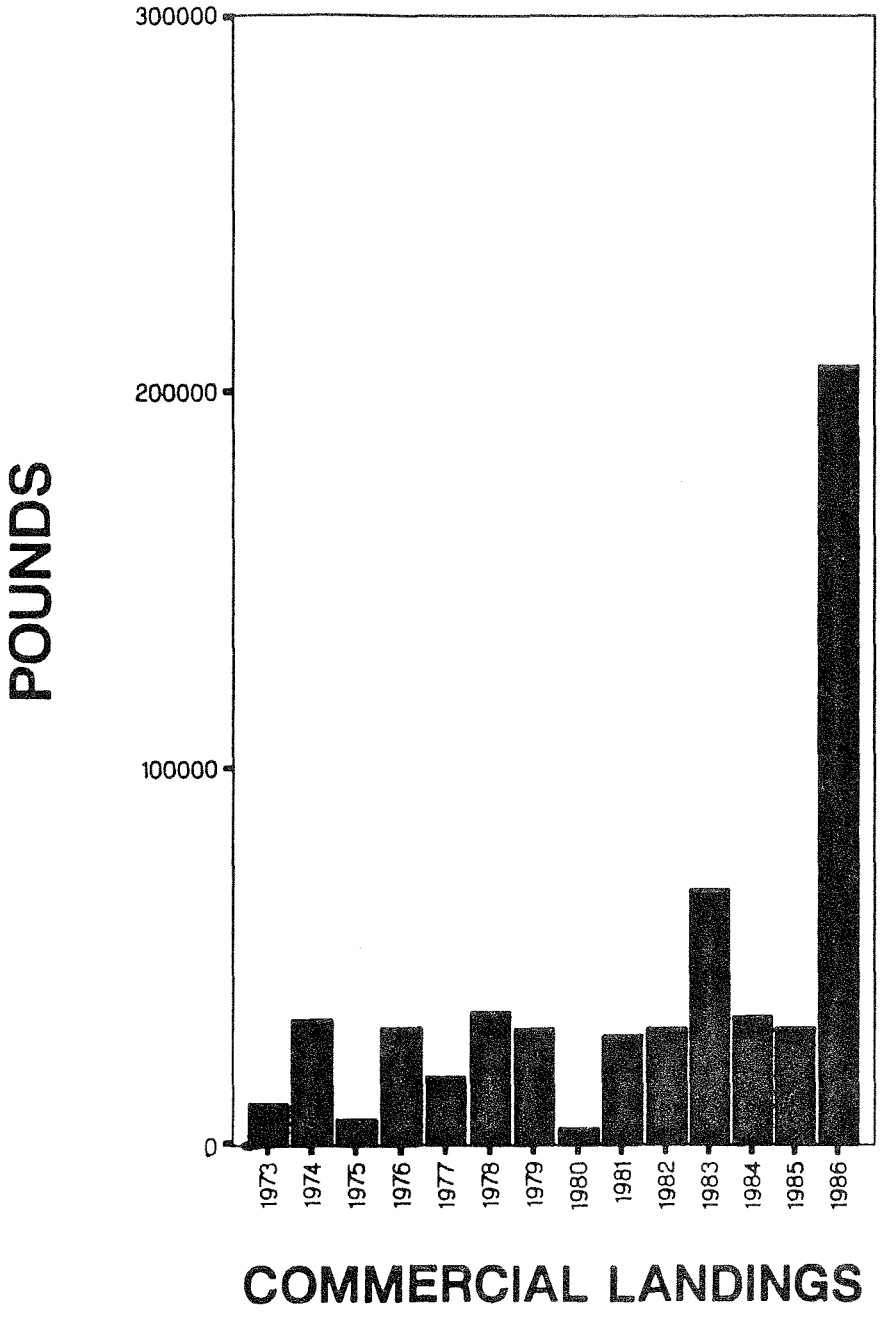


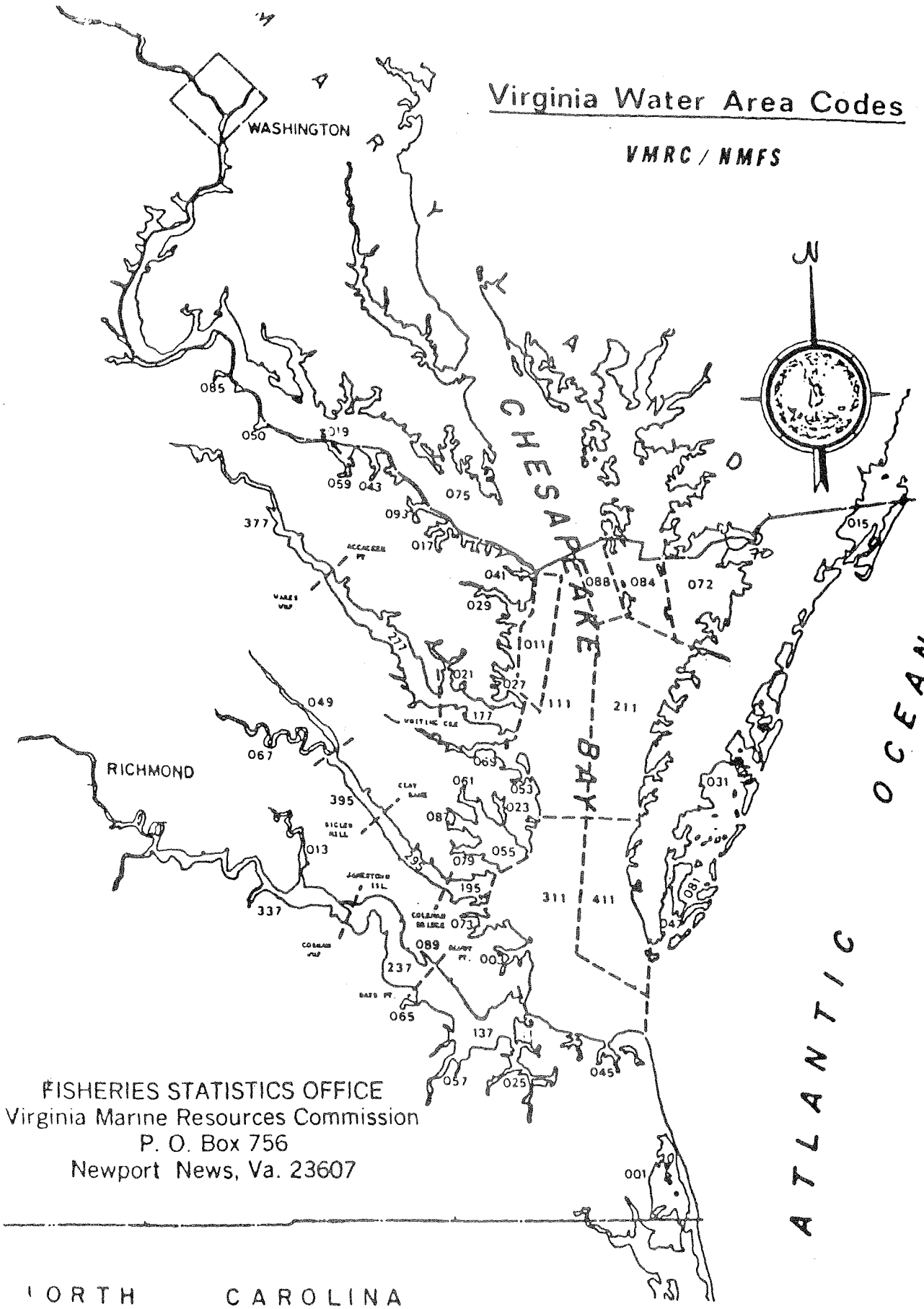
Figure 5. Commercial landings of black drum, Pogonias cromis, in Virginia from 1973 to 1986.

VIRGINIA COMMERCIAL LANDINGS
BLACK DRUM



DATA SOURCE. VMRC

Figure 6. Map of Chesapeake Bay showing the coded areas used by the Virginia Marine Resources Commission to report catch statistics. (Source: Virginia Marine Resources Commission).


Virginia Water Area Codes
VMRC / NMFS
WASHINGTON
RICHMOND
CHESAPEAKE BAY
ATLANTIC OCEAN
N
085
050
019
059
043
075
093
377
017
041
029
088
084
072
015
011
021
027
111
211
049
177
067
061
053
023
395
087
013
079
055
195
311
411
337
073
089
237
065
137
057
025
045
081
001
FISHERIES STATISTICS OFFICE
Virginia Marine Resources Commission
P. O. Box 756
Newport News, Va. 23607
NORTH CAROLINA